Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2541
Original Article

Evaluation of Semen Analysis Parameters Among Infertile Male Partners: A Retrospective Cross-Sectional Study on Sperm Concentration, Motility, and Morphology: Retrospective

[1]*Dr. Richa Bhartiya*, [2]*Dr. Abhijit Khandkar*,[3]*Dr. Nivedita Kumar*,*[4]*Dr. Pooja Tambe*,[5]*Dr. Manasi Karwa*,[6]*Dr. Sushma Ramraje*

[1]*Associate Professor, Department of Pathology, Grant Government Medical College and Sir JJ group of Hospitals, Mumbai 4000008*

[2]*Assistant Professor, Department of Pathology, Grant Government Medical College and Sir JJ group of Hospitals, Mumbai 4000008*

3Senior Resident, Department of Pathology, Grant Government Medical College and Sir JJ group of Hospitals, Mumbai 4000008

[4,5]*Junior resident, Department of Pathology, Grant Government Medical College and Sir JJ group of Hospitals, Mumbai 4000008*

[6] *Professor and HOD Pathology, Department of Pathology, Grant Government Medical College and Sir JJ group of Hospitals, Mumbai 4000008*

Abstract

Introduction:

Infertility is the inability to achieve pregnancy after 12 months of unprotected intercourse and affects 8–12% of couples worldwide. In India, primary infertility ranges from 3.9% to 16.8% and poses significant health and social concerns. Male-factor infertility accounts for 40–50% of cases and is characterized by abnormalities in sperm count, motility, morphology, or vitality. Semen analysis remains the most basic, cost-effective, and widely used tool for evaluating male infertility.

Aims and Objectives:

The objective of this study was to evaluate semen characteristics in male partners of infertile couples and assess the contribution of male-related factors to infertility.

Materials and Methods:

This retrospective analysis was conducted on 87 male partners of infertile couples who presented to a tertiary care center in Mumbai between February 2025 and January 2026. Semen specimens were obtained following 3–5 days of sexual abstinence and evaluated in accordance with WHO recommendations, assessing parameters such as semen volume, sperm concentration, motility, morphology, pH, and cellular components.

Results:

Out of 87 patients, 36 (41.37%) showed abnormal semen parameters. Oligozoospermia (16.09%) was the most common abnormality, followed by azoospermia (14.94%) and asthenozoospermia (10.34%). Abnormal findings were more common in patients aged >30 years (72.22%). Most samples (83.9%) had normal semen volume (2–4 mL), while 12.01% showed reduced motility (<40%).

Conclusion:

A significant proportion of infertile males showed abnormal semen parameters, highlighting the crucial role of semen analysis in infertility evaluation. Routine semen analysis should be recommended as a first-line investigation in all infertile couples, with early intervention strategies to improve reproductive outcomes.

Key words: *Infertility, Azoospermia, Oligozoospermia, Asthenozoospermia.*
Submitted: *February 02, 2026* ***Accepted:*** *February 28, 2026* ***Published:*** *March 30, 2026*

Corresponding author: *Dr. Pooja Tambe*
Email: *tambepooja001@gmail.com*
Junior resident, Department of Pathology, Grant Government Medical College and Sir JJ group of Hospitals, Mumbai 4000008

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2541
Original Article

Introduction

Infertility refers to the inability to achieve a clinical pregnancy after at least 12 months of consistent, unprotected intercourse (1). Infertility is a significant global problem that affects not only the health of couples but also has economic, demographic, and social consequences. It is becoming an increasing source of concern for many married couples. Worldwide, about 8–12% of couples experience infertility (2,3). In the Indian population, primary infertility demonstrates a prevalence ranging from 3.9% to 16.8%. Infertility may result from issues related to the female partner, the male partner, or both combined. Male-factor infertility accounts for 40–50% of affected couples and is typified by oligozoospermia, asthenozoospermia, teratozoospermia, or compromised sperm vitality. Deviations in these measurements can indicate underlying conditions that impair sperm production, transport, or functional development (4).

At present, a wide range of diagnostic tools is available for the evaluation of infertility; however, semen analysis remains the most fundamental and routinely utilized test. It is a relatively inexpensive tool that offers valuable clinical information (5). Considering the high occurrence and clinical significance of abnormal semen characteristics, analyzing seminal patterns is crucial for understanding male-related causes of infertility.

Thus, this study seeks to examine the seminal profiles of male partners of infertile couples and determine the extent to which male factors contribute to infertility within the study group.

Materials and Methods

Study Design

This was a **retrospective cross-sectional study** conducted to evaluate semen parameters among infertile male partners.

Study Setting

The study was carried out in the Department of Pathology at Grant Government Medical College and Sir JJ Group of Hospitals, Mumbai, a tertiary care teaching hospital catering to a large urban and referral population.

Study Duration

February 2025 to January 2026 (12 months).

Study Population

A total of 87 male partners of infertile couples were included.

Inclusion Criteria

Male partners of infertile couples
Age between 20–50 years
Available complete semen analysis reports

Exclusion Criteria

Incomplete records
Known systemic illness affecting fertility
Patients on hormonal therapy

Variables Studied

Semen volume, sperm concentration, motility, morphology, pH, and presence of cellular elements.

Data Collection Procedure

Semen samples were collected after 3–5 days of abstinence and analyzed according to **WHO guidelines**. Standard laboratory protocols were followed for the measurement of semen parameters. Quality control was ensured by standardized procedures and experienced laboratory personnel.

Bias

As this was a retrospective study, **selection bias and information bias** may be present. These were minimized by including all eligible cases during the study period and using standardized WHO criteria.

Sample Size Justification

All available cases during the study period (n=87) were included, making it a **convenience sample**.

Statistical Analysis

Data were analyzed using descriptive statistics. Results were expressed as percentages and proportions.

Ethical Consideration

The study was conducted after approval from the Institutional Ethics Committee. Patient confidentiality was maintained.

Result

A total of **87 male partners of infertile couples** were included in the study. The age of participants ranged from **20 to 50 years**, with a mean age of **35 years**.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2541
Original Article

Out of the total study population, **36 cases (41.37%)** demonstrated **abnormal semen parameters**, while **51 cases (58.62%)** had normal semen findings.

Abnormal semen parameters were more frequently observed in patients aged **>30 years (26 cases; 72.22%)** compared to those aged **≤30 years (10 cases; 27.78%)**.

Table 1: Age-wise Distribution of Abnormal Semen Parameters (n = 36)

Age Group	Number of Cases	Percentage (%)
≤30 years	10	27.78
>30 years	26	72.22
Total	**36**	**100**

With respect to semen volume, the majority of patients had values within the normal range of 2–4 mL. Only a small proportion showed decreased or increased volume.

Table 2: Distribution of Semen Volume (n = 87)

Semen Volume (mL)	Number of Cases	Percentage (%)
<2 mL	8	9.19
2–4 mL	73	83.90
4–6 mL	6	6.89
Total	**87**	**100**

Analysis of sperm concentration among abnormal cases revealed that the majority had a severe reduction in sperm count.

Table 3: Distribution of Sperm Concentration (n = 14)

Sperm Concentration (million/mL)	Number of Cases	Percentage (%)
<5	6	42.85
5–10	3	21.43
10–15	5	35.71
Total	**14**	**100**

Regarding sperm motility, most cases showed motility above 40%, while a smaller proportion demonstrated reduced motility.

Table 4: Distribution of Sperm Motility (n = 87)

Motility (%)	Number of Cases	Percentage (%)
<40%	9	10.34
≥40%	78	89.66
Total	**87**	**100**

The pattern of semen abnormalities showed that oligozoospermia was the most common abnormality, followed by azoospermia and asthenozoospermia.

Table 5: Distribution of Seminal Abnormalities (n = 87)

Parameter	Number of Cases	Percentage (%)
Normozoospermia	51	58.62
Oligozoospermia	14	16.09
Azoospermia	13	14.94

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2541
Original Article

Asthenozoospermia	9	10.34
Oligoasthenozoospermia	4	4.59

Overall, the findings indicate that a substantial proportion of infertile males exhibited abnormal semen parameters, with **sperm concentration defects (oligozoospermia)** being the most prevalent, followed by **azoospermia** and **motility abnormalities**. Increasing age appeared to be associated with a higher frequency of abnormal findings.

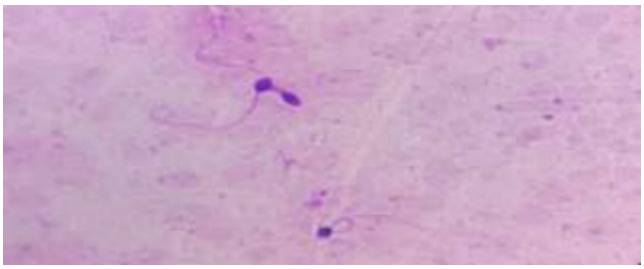

Fig.1 (H&E X1000) Spermatozoa with coiled tail.

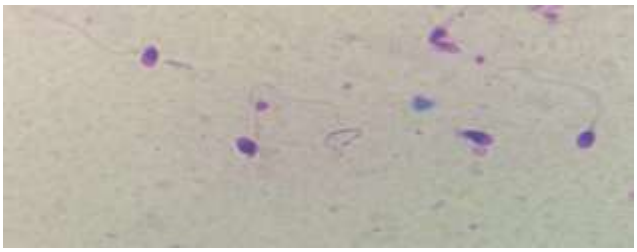

Fig.2 (H&E X1000) Spermatozoa with bent head

Oligozoospermia was the most common abnormality identified in (14 cases;16.09%%), followed by azoospermia(13cases;14.94%), then asthenozoospermia in (09cases;10.34%) and oligoasthenozoospermia (04cases;4.5%). Normozoospermia was observed in (51 cases;58.62%). (Table2)

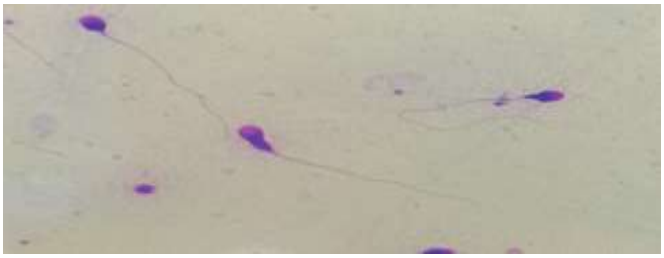

Fig.3 (H&E X1000) Spermatozoa with thick middle piece.

Discussion

The present study was conducted to determine the abnormalities in semen samples for the detection of male infertility. The most common abnormality encountered was oligozoospermia, followed by azoospermia and asthenozoospermia.

Abnormal seminal parameters were analyzed with respect to age and compared with Jajoo S et al.(7) In our study, abnormal semen analysis was seen in 27.7% of patients aged

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2541
Original Article

≤30 years and 72.22% aged >30 years, while Jajoo S et al(7) reported 48% and 52% respectively.

The most common abnormality in our study was abnormal sperm count (16.09%), followed by absence of sperm (14.94%) and reduced motility (10.34%).

Normozoospermia constituted 58.62% of cases in our study, which is lower than Samal et al. (6)(61.98%) and Kalavathi et al. (8)(65.6%), but slightly higher than Sethi et al.(9) (48.36%) and much higher than Agarwal et al.(10)(8%).

Oligozoospermia accounted for 14% of cases, lower than Samal et al. and Kalavathi et al., but higher than Sethi et al. and Agarwal et al.

Azoospermia was observed in 16.09% of cases, exceeding rates reported by Samal et al., Kalavathi et al., and Sethi et al., but slightly lower than Agarwal et al., where it was the most common abnormality.

Asthenozoospermia was observed in 10.34% of our subjects, higher than Samal et al. (1.45%) and Kalavathi et al. (1.2%), but lower than Sethi et al. (14.75%) and Agarwal et al. (24%), reflecting regional and population-based variations in sperm motility disorders.

	Our study 2025 (n=65)	Samal et al. (6) 2012 (n=3000)	Kalavathi et al. (8) (8)2016 (n=250)	Agarwal et al.(10) 2023	Sethi et al.(9) 2025
Normozoospermia	58.62%	61.98%	65.6%	8%	48.36%
Oligozoospermia	16.09%	29.13%	24.8%	8%	9.02%
Azoospermia	14.94%	6.75%	8.4%	26%	11.47%
Asthenozoospermia	10.34%	1.45%	1.2%	24%	14.75%

Table 3: Abnormality in number and motility compared to other studies.

In our study, 9.1% of males had semen volume <2 mL, 83.9% had 2–4 mL, and 6.89% had 4–6 mL. The prevalence of low-volume semen (<2 mL) is considerably lower than the 23.3% reported by Khan et al.(11)and 24.5% observed by Mahdi et al.(12). In contrast, Tilahun et al.(13) reported 8.4% low-volume semen in an Ethiopian infertile population, slightly higher than our study, indicating regional and population-based variations in semen volume among infertile men.

Limitations

This study has certain limitations. Being retrospective, it is subject to selection and information bias. The sample size was relatively small and from a single center, limiting broader applicability. Additionally, advanced diagnostic tests such as hormonal assays and genetic studies were not included.

Recommendation:

Routine semen analysis should be incorporated as an essential component of infertility evaluation. Further large-scale, multicentric studies incorporating advanced diagnostic parameters are recommended.

Generalizability

The findings may be applicable to similar tertiary care settings; however, caution should be exercised while generalizing to the general population due to the hospital-based sample.

Conclusion

The study highlights a notable proportion of male partners of infertile couples exhibiting abnormal seminal characteristics at our facility. The findings reinforce that male factors contribute significantly to infertility, with

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2541
Original Article

oligozoospermia then azoospermia, followed by asthenozoospermia emerging as the most frequently observed abnormalities. By applying WHO standards for semen collection and analysis, this study ensured reliable evaluation of key parameters such as sperm concentration, motility, morphology, and volume. The high prevalence of deviations in these indices suggests underlying disturbances in spermatogenesis, sperm maturation, or genital tract function among a substantial proportion of participants. These results highlight the essential role of semen analysis as a primary diagnostic tool in assessing male reproductive health and underscore the need for routine, standardized evaluation in infertility work-ups. Early identification of seminal abnormalities can guide appropriate clinical decisions, promote targeted interventions, and ultimately improve the management and outcomes for infertile couples.

Source of Funding
The authors declare that no funding was received for this study.

Conflict of Interest
The authors declare no conflict of interest.

Author Contributions
- Dr. Richa Bhartiya – Study design, supervision
- Dr. Abhijit Khandkar – Data analysis
- Dr. Nivedita Kumar – Data collection
- Dr. Pooja Tambe – Manuscript drafting
- Dr. Manasi Karwa – Literature review
- Dr. Sushma Ramraje – Final review and approval

Data Availability
The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Author Biography
Dr. Richa Bhartiya is an Associate Professor in the Department of Pathology with expertise in reproductive pathology. Other authors are faculty and residents actively involved in clinical and diagnostic research.

References
1. World Health Organization. Infertility fact sheet. Geneva: WHO; 2021.
2. Sciarra J. Infertility: an international health problem. (IJRCOG)1994;46:155-63.
3. Population Council. New Delhi: Population Council. infertility. Looking back, looking forward: a profile of sexual and reproductive health in India; 2004;67- 72
4. Garg, J. et al. (2020). Abnormal semen parameters among males in infertile couples: a cross-sectional study from a tertiary care centre. *(IJRCOG)9*(8), 3398–3401. https://doi.org/10.18203/2320-1770.ijrcog20203330
5. Gupta N et al. Semen analysis profile among male partners of infertile couples in North India. (IJRCOG)2020;9(7):2915-2920.
6. Samal S. et al. Epidemiological Study of Male Infertility. Indian Medical Gazette 2012.
7. Jajoo S. et al Prevalence of abnormal semen analysis in patients of infertility at a rural setup in Central India(IJRCOG) 2013;2:161-4. 9
8. Kalavathi B. Male factor in infertility: Study from a tertiary care hospital. (IJRCOG). 2016 June; 5(6):2022-2025. 10
9. Sethi N. et al Evaluation of the complete profile of male partners in infertile couples with special emphasis on detection of genital tuberculosis. *(IJRCOG)* 2024;13(5):1149-56.
10. Agarwal A. et al Insight into epidemiology of male infertility in central India. (IJRCOG) 2023;12(1):215-20.
11. Khan MS. et al Seminal volume in the investigation of male infertility. *J Coll Physicians Surg Pak*. 2012;22(3):159–162.
12. Mahdi BM. et al. Semen Analysis and Insight into Male Infertility. *Open Access Macedonian Journal of Medical Sciences (OAMJMS)*. 2021;9(A):252–256. doi: 10.3889/oamjms.2021.5911.
13. Tilahun T. et al Pattern of semen analysis in male partners of infertile couples in Western Ethiopia: retrospective cross-sectional study. *SAGE Open Med*. 2022;10:205031212210881

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2541
Original Article

PUBLISHER DETAILS

Student's Journal of Health Research (SJHR)
(ISSN 2709-9997) Online
(ISSN 3006-1059) Print
Category: Non-Governmental & Non-profit Organization
Email: studentsjournal2020@gmail.com
WhatsApp: +256 775 434 261
Location: Scholar's Summit Nakigalala, P. O. Box 701432, Entebbe Uganda, East Africa